ChangeLog Preparatory Problems IChO 2023 V2

Problems (Theory):

- G0 General Instructions
  - Nernst equation was corrected (ln(Q) out of the fraction)
- Q5
  - Introduction: Oxidation state of RuO_2 was added explicitly in the Latimer Diagram
  - 5.9 H2O → H_2O
- Q7
  - 7.4 Added the hint that the deprotonation steps can be considered decoupled.
  - 7.7 **Calculate** how long it will take until the limiting value of 90 µg/L is reached. → **Calculate** how long it will take until the limiting value of 90 µg/L free Pb is reached.
  - Paragraph after 7.7 monitored over a period of 6 hours → monitored by the concentration change in free Pb over a period of 6 hours
  - 7.8 Clarified the apparent half life and rate constant for the clearance of free Pd of the patients blood should be calculated.
  - 7.9 Clarified that the free Pb concentration is meant, and the complex can be ignored.
- Q19
  - Introduction: retention time → reduced/adjusted retention time
- Q24
  - Removed “Introductory Text” before introduction
- Q30
  - Intro 30.1 The construction of the A/B ring fragment → The construction of the B/C ring fragment
  - 30.2 assembly of the A/B ring system in **I** → assembly of the B/C ring system in **I**
  - 30.3 containing the C/D ring system both fragments were coupled → containing the A/D ring system both fragments were coupled:
  - Figure 35.5 Missing ester group in the product was added

Problems (Practical):

- Q6
  - Glassware and equipment: 25 ml round bottom flask → 50 ml round bottom flask
  - Glassware and equipment: Cork ring (for 25 mL round-bottom flask) → Cork ring (for 50 mL round-bottom flask)
  - Synthesis step 2.: **Clamp** a 25 mL round-bottom flask → **Clamp** a 50 mL round-bottom flask

Solutions (Theory):

- Q6
  - 6.5 Font color was changed and missing -1) was inserted in the last line
- Q7
  - 7.4 Added justification for the approximation of decoupling the steps
  - 7.5 Added missing methyl groups on O-methyl-DMSA
- Q9

    - 9.7 First checkbox was unchecked, the option was wrong as described in the text below
- Q23
    - 23.6 Structure **K** was corrected – missing oxygen next to fluorenylmethyl was inserted
- Q25
    - 25.2 Structure **A** was changed from a hemiacetal to a methyl acetal
- Q15,16 were designed better
- In general the solutions were designed a bit more consistently

ChangeLog Preparatory Problems IChO 2023 V3

Problems (Theory):

- Q2
  - 2.1 Inserted a 2 before H^+ to be clear
- Q4
  - 4.6 $S°(ZnO) = -43.6 \rightarrow S°(ZnO) = 43.6$
  -
- Q5
  - Molar mass of $Ru(H_2O)_3Cl_3$ was corrected from 262.05 to 261.48 g/mol
  - Table 1 below 5.8: The last reaction equation was incorrectly balanced:
    $MnO_4 + 2H_3O^+ + e^- \rightarrow H_2MnO_4 + \cancel{3}2H_2O$
  - Table 2 below 5.8: The charge in the last reaction equation was incorrect
    $MnO^-_4 + e^- \rightarrow MnO^{\cancel{3}2-}_4$
- Q18
  - 18.2 Stated pressure and temperature of oxygen stream (298 K and 100000 Pa)
  - Paragraph above 18.5 Specification that the particles are assumed to have a spherical shape
  - 18.5, 18.6 Corrected unit $nm^{-3} \rightarrow nm^3$
- Q19
  - 19.2 $XeO_4 \rightarrow XeOF_4$
- Q29
  - 29.3 Vis under the reaction arrow was removed. This would be for the reverse reaction.

Solutions (Theory):

- Refinement to make them more consistent
- Q6
  - Natural abundance was interpreted wrong. The first line was replaced with the corrected mass